

Astrophysics and Geophysics

DETERMINING METALLICITIES OF STARS WITH PLANETS

TalaWanda Rose Monroe^{ab}, monrotr@wku.edu
Stacy Sidle, Rhodes College, sidsm@rhodes.edu
Catherine Pilachowski^{b*}, catyp@astro.indiana.edu

^aWestern Kentucky University
Department of Physics and Astronomy
1 Big Red Way
Bowling Green, KY 42101

^bIndiana University
Astronomy Department
727 East 3rd Street, Swain Hall West 319
Bloomington, IN 47405-7105

We present results of a spectroscopic fine analysis carried out in standard Local Thermodynamic Equilibrium of τ Boo, ρ CrB, and 51 Peg, three stars reported to have planetary mass companions. From high-resolution, high signal-to-noise ratio echelle spectra, we derive $[\text{Fe}/\text{H}]$ for these stars: 0.17 ± 0.13 , -0.32 ± 0.12 , and 0.11 ± 0.05 respectively. Spectral synthesis was employed to derive $\log \epsilon(\text{Li})$ values for ρ CrB and 51 Peg, 1.06 and 1.11 respectively. We compare these metallicities with the abundances of three stars which are not known to harbor Jovian-mass planets, γ Ser, 110 Her, and β Aql. We find that stars with planets have higher metal abundances in lighter elements such as Mg, Al, and Si; supporting the planet-SMR star connection.